Cancer Cluster Investigations

Introduction

A cancer cluster is defined as a greater than expected number of cancers occurring among people who live or work in the same area and who develop the disease within a short time of each other. One of the more difficult tasks of the Texas Department of Health (TDH) is the challenge of responding to anecdotal observations of potential space-time "clustering" of cancer among Texas residents. The Cancer Registry Division (CRD) of TDH has been tasked with the responsibility for investigating perceived excesses of cancer. The CRD must deal with issues inherent in both the natural history of cancer and the available statistical methodology which complicate the investigation of any report of a possible excess of cancer.

Cancer is a very common disease, much more common than most people realize. Approximately two out of every five persons alive today will develop some type of cancer in their lifetimes. Furthermore, cancer is not one disease, but many different diseases, each with a different set of causal factors. Current research indicates that the occurrence of any given cancer is dependent on the interaction of many separate causal factors such as age, race, sex, inherited susceptibility, geographic area, and lifestyle. It is unlikely that any one factor is both necessary and sufficient to cause a cancer. Even for tobacco, exposure does not always result in lung cancer. In addition to the difficulty of establishing a causal relationship for any given exposure, the latency period between time of exposure and development of disease must also be considered. It takes a long time for cancer to develop, usually 20 to 40 years. Conditions that have prevailed for only the last 5 to 10 years are unlikely to be related to the current incidence of cancer in a community.

Cancer Cluster Investigation Protocol

Based on guidelines published by the Centers for Disease Control and Prevention (CDC), the Cancer Registry Division developed a four-stage protocol for investigating potential cancer clusters. To assess a cluster, this protocol relies on measuring statistical significance, determining biological plausibility, and identifying possible pathways of exposure. It is distinguished from other protocols by the use of incidence data derived from

the Registry rather than the informant. Pertinent data regarding the potential cluster are obtained during the initial contact with the informant, including number and types of cancer cases, time period, geographic area of concern and suspected exposure(s). The initial contact also is used as an educational opportunity to provide the caller with basic information on cancer. For the investigation to proceed beyond this stage, the initial data must indicate that:

- The cluster consists predominantly of the same cancer site or multiple sites that may be related to a common exposure.

and

- There is an adequate latency period as measured by the length of time cases have resided in the area.

or

- There is inadequate information to judge either of the above.

If the initial contact permits satisfactory closure, then a summary report reiterating the educational information is sent to the informant.

The second stage of the investigation consists of multiple, concurrent steps: a preliminary evaluation to provide an estimate of the statistical likelihood that an important excess has occurred, an exposure evaluation to identify a biologically plausible environmental exposure(s), and an assessment of possible pathways of exposure. If specific environmental concerns were raised during the initial contact, the Health Studies Program of the Texas Department of Health is notified and assists in the investigation by obtaining information regarding possible environmental exposures. If the preliminary evaluation suggests no excess or does not meet specific criteria, a written report is sent to the informant indicating the findings, including any environmental exposure information, and advising that no further evaluation is warranted. However, if an excess is indicated and the biological plausibility is compelling, the next stage of the investigation is a feasibility study.

The feasibility study is designed to determine the appropriateness of performing a full-scale epidemiological study to investigate the relationship between the health event and a putative exposure(s). This evaluation begins with a written protocol that outlines the costs and provides information on data collection, proposed methodology, and the plan for data analysis. If the feasibility study suggests that little will be gained from an etiologic

investigation, a written report is sent to the informant, as well as other interested parties, summarizing the results of this process; regardless of biologic merit, however, the public or media may continue to demand further investigation. Community relations, media contacts, and advisory committee interaction are critical for an appropriate public health response.

If the feasibility study suggests that an etiologic investigation is warranted, an epidemiological study will be recommended. The purpose of the study is to perform an etiologic investigation of a potential disease-exposure relationship and pursue epidemiological and public health issues – **not necessarily to investigate a specific cluster.** The results from this study are expected to contribute to epidemiological and public health knowledge.